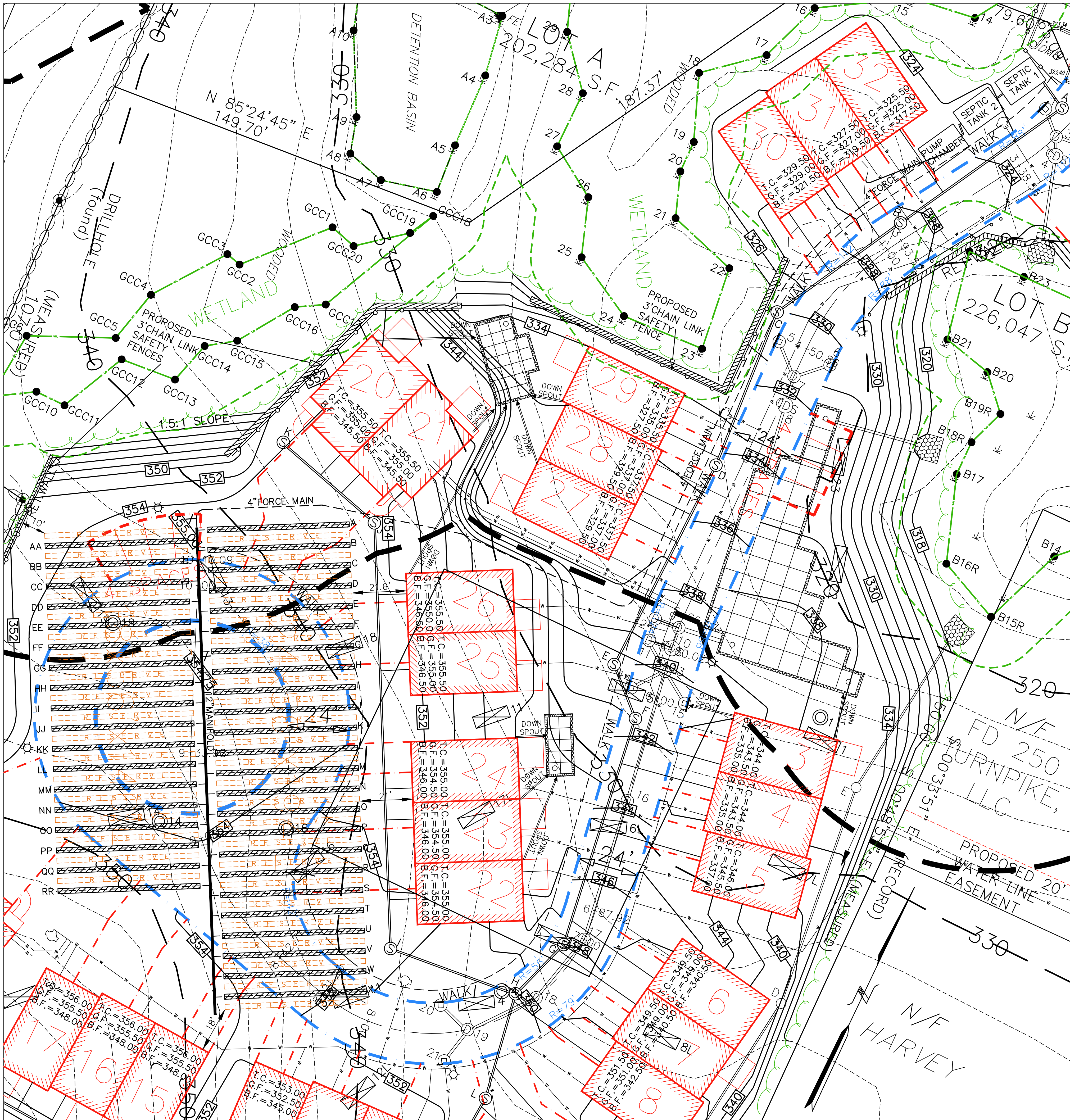




PERCOLATION TESTS			
PERCOLATION TEST #:	14	DATE:	8/24/2022
PERCOLATION RATE:	5	MIN./IN.	
DEPTH OF PERC:	48"		
PERCOLATION TEST #:	16	DATE:	8/24/2022
PERCOLATION RATE:	6	MIN./IN.	
DEPTH OF PERC:	43"		
PERCOLATION TEST #:	19	DATE:	8/24/2022
PERCOLATION RATE:	20	MIN./IN.	
DEPTH OF PERC:	50"		
THE PERCOLATION TESTS ON BOTH SEPTEMBER 7 AND OCTOBER 19, 2022 WERE CONDUCTED BY JAMES TETREAULT, SOIL EVALUATOR #2421. THESE TESTS WERE OBSERVED BY DENNIS COSTELLO, THE SOUTHBOROUGH BOARD OF HEALTH'S AGENT.			
DESIGN PERCOLATION RATE: 20 MINS. PER INCH			

- GENERAL NOTES**
- ALL CONSTRUCTION SHALL CONFORM TO THE TOWN OF SOUTHBOROUGH HEALTH RULES AND REGULATIONS AND TITLE 5, THE STATE ENVIRONMENTAL CODE.
 - THIS PLAN IS TO BE USED ONLY FOR THE CONSTRUCTION OF THE DESIGNED DISPOSAL SYSTEM AND DOES NOT REPRESENT ACTUAL AS BUILT CONDITIONS UNLESS OTHERWISE NOTED.
 - THE PROPOSED SYSTEM SHOWN HEREON IS NOT DESIGNED FOR THE USE OF GARBAGE DISPOSALS AND SAID USE IS NOT ALLOWED.
 - THE SEPTIC TANKS SHOULD BE PUMPED OUT EVERY YEAR.
 - ALL WASHED STONE IN TRENCHES MUST HAVE LESS THAN 0.2 PERCENT MATERIAL FINER THAN NUMBER 200 SIEVE AS DETERMINED BY AASHTO (AS MOST RECENTLY AMENDED) AND BE DOUBLE WASHED.
 - TIGHT JOINT PIPING TO CONSIST OF POLYVINYL CHLORIDE PIPE (PVC) SCHEDULE 40, UNLESS OTHERWISE NOTED.
 - THERE ARE SEVERAL WETLAND RESOURCE AREAS ON THIS PROPERTY. THESE WETLAND BOUNDARIES HAVE BEEN FLAGGED BY THE STAFF OF GODDARD CONSULTING, LLC, AND CONFIRMED BY THE SOUTHBOROUGH CONSERVATION COMMISSION WITH AN ORDER OF CONDITIONS.
 - PIPING FROM THE PROPOSED TOWNHOUSES TO THE MAIN IN THE DRIVEWAY AND FROM MANHOLE TO MANHOLE IS TO CONSIST OF POLYVINYL CHLORIDE PIPE (PVC) SCHEDULE 40 PIPE. THE 4" FORCE MAIN, 12" MANHOLE AND 2" DISTRIBUTION LINES ARE TO BE CLASS 150 PRESSURE PIPE.
 - TWO NEW BARNES MODEL 4SE11334HL 7.5 HPE PUMPS SHALL BE INSTALLED ON A PULTRUDED SLIDE RAIL FOR EASE OF ACCESS AND MAINTENANCE. THE PUMPS SHALL ALTERNATE AND WILL HAVE DUPLEX CONTROLS WITH A CONTROL BOX IN THE PROPOSED BUILDING.
 - TO PREVENT POTENTIAL SEWAGE BREAKOUT, AN IMPERMEABLE BARRIER WILL BE INSTALLED IN FRONT OF THE RETAINING WALL PROPOSED NORTH OF THE SOIL ABSORPTION SYSTEM ACCORDANCE WITH 310 CMR 15.255(2). THE ELEVATION OF THE TOP OF THE BARRIER SHALL BE AT LEAST THE BREAKOUT ELEVATION AND THE BASE OF THE BARRIER SHALL BE AT LEAST 1 FOOT BELOW EXISTING GROUND.
 - THE PROPOSED 6 INCH DIAMETER FORCE MAIN SHALL HAVE 4 FEET OF COVER AT ALL TIMES AND SHALL BE PITCHED TO DRAIN BACK INTO THE PUMP CHAMBER.
 - THIS DEVELOPMENT IS PROPOSED UNDER AN APPLICATION FOR A COMPREHENSIVE PERMIT PURSUANT TO MASSACHUSETTS GENERAL LAWS (M.G.L.) CHAPTER 40B.

2" LATERAL INVERTS IN TRENCHES:			
A1	309.00	A	309.00
B1	309.00	B	309.00
C1	309.00	C	309.00
D1	309.00	D	309.00
E1	309.00	E	309.00
F1	309.00	F	309.00
G1	309.00	G	309.00
H1	309.00	H	309.00
I1	309.00	I	309.00
J1	309.00	J	309.00
K1	309.00	K	309.00
L1	309.00	L	309.00
M1	309.00	M	309.00
N1	309.00	N	309.00
O1	309.00	O	309.00
P1	309.00	P	309.00
Q1	309.00	Q	309.00
R1	309.00	R	309.00
		S	309.00
		T	309.00
		U	309.00
		V	309.00
		W	309.00
		X	309.00

DEEP OBSERVATION HOLES			
HOLE: 13	DATE: 8/24/2022	HOLE: 14	DATE: 8/24/2022
SOIL DEPTH, HORIZON, & TEXTURE:		SOIL DEPTH, HORIZON, & TEXTURE:	
0'-6" A SANDY LOAM		0'-6" A SANDY LOAM	
6'-21" B SANDY LOAM, EXTREMELY COBBLY		6'-20" B SANDY LOAM	
21'-40" C1 SANDY LOAM, V.GRAVELLY, COBBLY		20'-44" C1 SANDY LOAM, V.GRAVELLY, COBBLY	
40'-61" C2 SANDY LOAM, V.GRAVELLY, COBBLY WITH MOTTLING		44'-68" C2 SANDY LOAM, V.GRAVELLY, COBBLY WITH MOTTLING	
SURFACE EL.: 341.90		SURFACE EL.: 348.10	
EST. SEASONAL HIGH GROUND WATER: 338.57		EST. SEASONAL HIGH GROUND WATER: 344.43	
WEeping WATER EL.: NOT OBS.		WEeping WATER EL.: NOT OBS.	
STANDING WATER EL.: NOT OBS.		STANDING WATER EL.: NOT OBS.	
BEDROCK EL.: NOT OBS.		BEDROCK EL.: NOT OBS.	
HOLE: 16	DATE: 8/24/2022	HOLE: 18	DATE: 8/24/2022
SOIL DEPTH, HORIZON, & TEXTURE:		SOIL DEPTH, HORIZON, & TEXTURE:	
0'-5" A SANDY LOAM		0'-8" A SANDY LOAM	
5'-25" B SANDY LOAM		8'-21" B SANDY LOAM	
25'-40" C1 SANDY LOAM, V.GRAVELLY, COBBLY		21'-40" C1 SANDY LOAM, V.GRAVELLY, COBBLY	
40'-78" C2 SANDY LOAM, V.GRAVELLY, COBBLY WITH MOTTLING		40'-62" C2 SANDY LOAM, V.GRAVELLY, COBBLY WITH MOTTLING	
SURFACE EL.: 341.25		SURFACE EL.: 339.01	
EST. SEASONAL HIGH GROUND WATER: 337.92		EST. SEASONAL HIGH GROUND WATER: 335.68	
WEeping WATER EL.: NOT OBS.		WEeping WATER EL.: NOT OBS.	
STANDING WATER EL.: NOT OBS.		STANDING WATER EL.: NOT OBS.	
BEDROCK EL.: NOT OBS.		BEDROCK EL.: NOT OBS.	
HOLE: 19	DATE: 8/24/2022		
SOIL DEPTH, HORIZON, & TEXTURE:			
0'-7" A SANDY LOAM			
7'-24" B SANDY LOAM			
24'-38" C1 SANDY LOAM, V.GRAVELLY, COBBLY			
38'-74" C2 SANDY LOAM, V.GRAVELLY, COBBLY WITH MOTTLING			
SURFACE EL.: 343.95			
EST. SEASONAL HIGH GROUND WATER: 340.78			
WEeping WATER EL.: NOT OBS.			
STANDING WATER EL.: NOT OBS.			
BEDROCK EL.: NOT OBS.			
SOIL EVALUATOR: JAMES TETREAULT, PE OBSERVED BY TOWN AGENT: DENNIS COSTELLO			

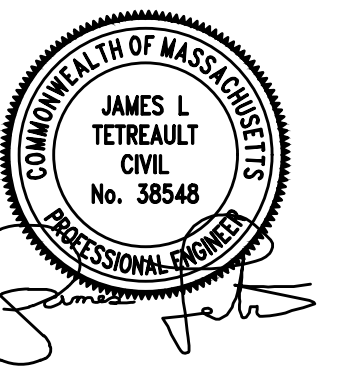
DESIGN CALCULATIONS			
68 BEDROOMS IN 32 TOWNHOUSE UNITS (28 WITH 2 BR AND 4 WITH 3 BR)			
=7,480 GALLONS			
SIDE (4 S.F.) x (0.53 GAL./S.F.)=	2.12	GALS.	42 LINES
BOTTOM (2 S.F.) x (0.53 GAL./S.F.)=	1.08	GALS.	56 FEET LONG
TOTAL GALLONS DISPERSED PER 1' OF TRENCH	3.20	GALS.	2 FEET WIDE
LENGTH OF TRENCH REQUIRED = $\frac{7,480}{3.20}$	2,338	FT.	2 FEET OF STONE
LENGTH OF TRENCH PROVIDED	2,352	FT.	TOTAL AREA OF SYSTEM = 14,112 S.F.
SYSTEM CAPACITY = 14,112 s.f. x 0.53 GPD/s.f. = 7480 GPD			

DESIGN ELEVATIONS	BENCH MARKS
PROPOSED BUILDING ELEVATIONS: INLET ELEVATIONS WILL VARY MANHOLE RIM AND INVERT ELEVATIONS ARE SHOWN ON SHEET D2 OF THE SITE PLANS.	GIVEN THE EXTENT OF EARTHWORK THAT WILL BE NECESSARY FOR THE GRADING IN THE AREA OF THE SOIL ABSORPTION SYSTEM, TWO OR MORE BENCHMARKS FOR THE CONSTRUCTION OF THE SEPTIC SYSTEM WILL BE SET AFTER CLEARING IS COMPLETED.
PROPOSED FIRST SEPTIC TANK: SIZE OF SEPTIC TANK: 7,500 GALLONS INLET: 317.50 OUTLET: 317.25	
PROPOSED SECOND SEPTIC TANK: SIZE OF SEPTIC TANK: 7,500 GALLONS INLET: 317.15 OUTLET: 316.90	
PROPOSED PUMP CHAMBER: SIZE OF PUMP CHAMBER: 12,000 GALLONS INLET: 316.70 PUMP OFF: 316.45	
PROPOSED DISTRIBUTION LATERALS: INVERT: 350.70	

LEGEND	
PERCOLATION TEST	⊙
DEEP OBSERVATION HOLE	⊗
DISTRIBUTION BOX	⊕
SEPTIC TANK	⊞
WATER LINE	— W —
DRAIN LINE	— D —
BORDERING VEGETATED WETLANDS	— WL —
100' BUFFER LINE	—
EXISTING BROOK	—
EXISTING GRADE	—
PROPOSED GRADE	—
CLEARING AREA	—

SEWAGE DISPOSAL SYSTEM PLAN

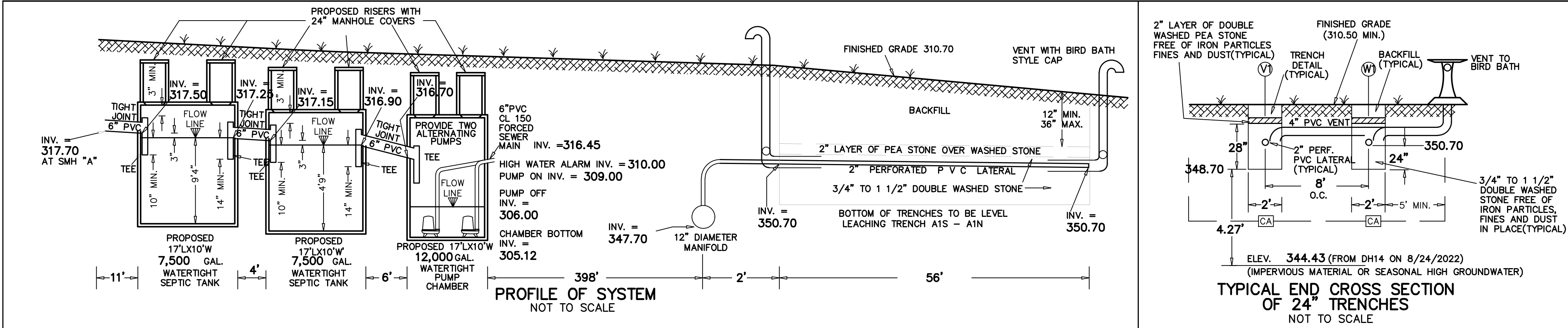
LOT ADDRESS: 250 TURNPIKE ROAD, LOT B AREA OF LOT: 226,047 S.F.
IN
SOUTHBOROUGH, MASS.
PREPARED FOR:
FD 250 TURNPIKE, LLC
118 TURNPIKE ROAD, SUITE 300
SOUTHBOROUGH, MA 01772



EXPEDITED ENGINEERING, LLC
CIVIL ENGINEERS & LAND SURVEYORS
118 TURNPIKE ROAD, SUITE 300
SOUTHBOROUGH, MA 01772
(508) 399-9993

SCALE: 1 INCH = 20 FEET
DATE: NOVEMBER 20, 2024
REVISIONS:

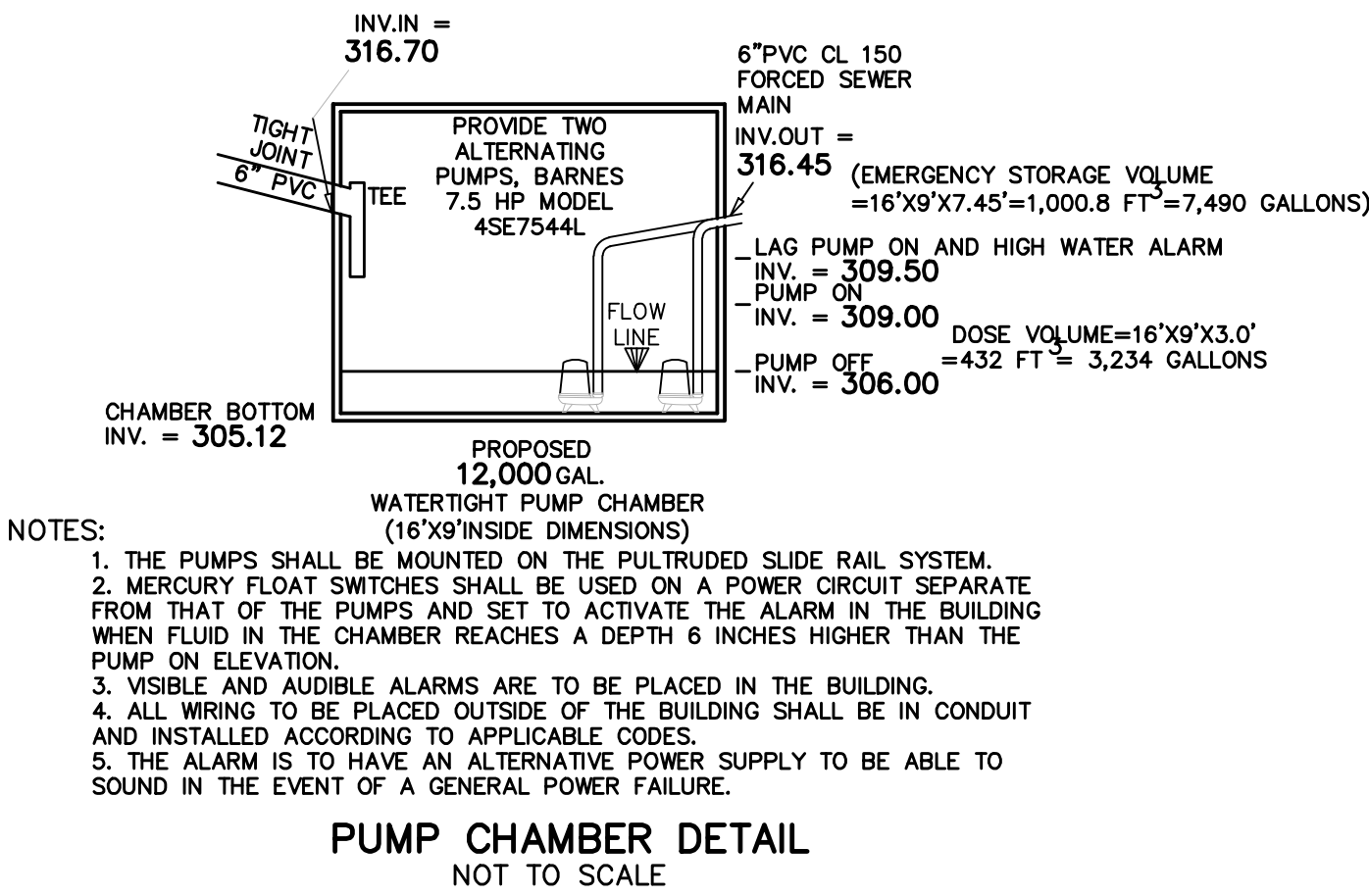
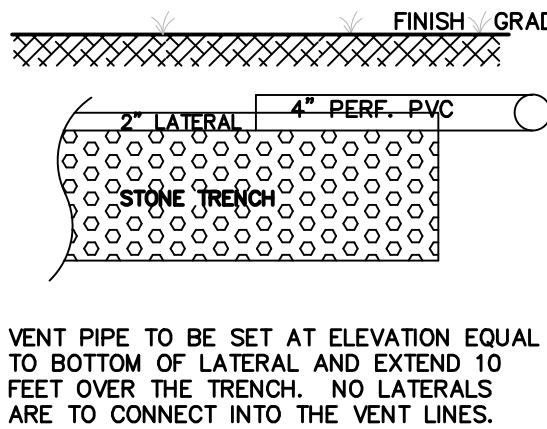
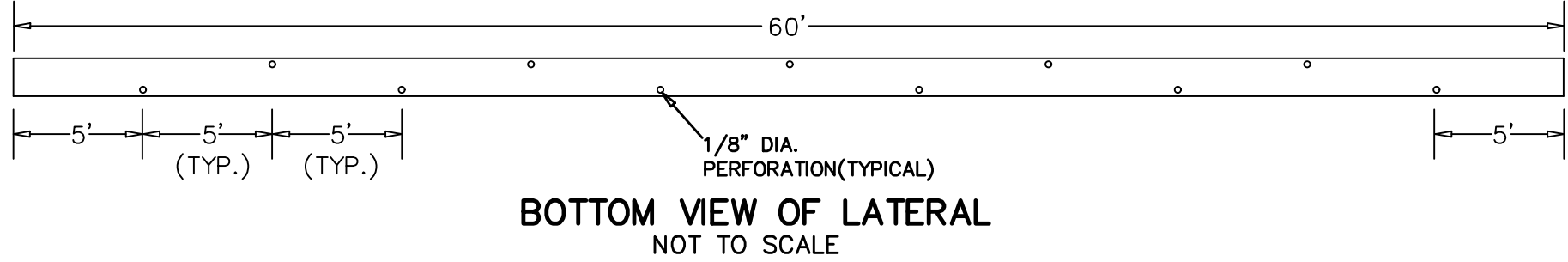
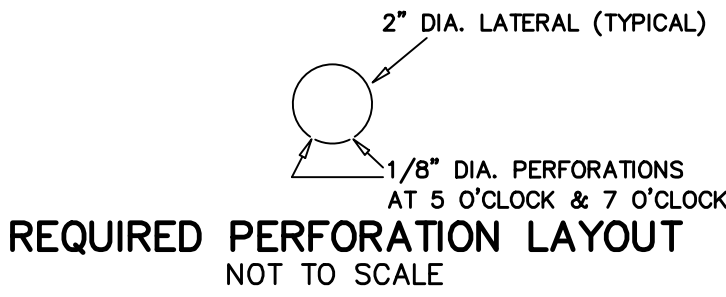
DESIGNED BY: JLT
DRAWING NAME: 120TURNPIKECURRENT
CLIENT NO.: 504 JOB NO.: 290-504



CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL HAVE THE BOTTOM OF THE EXCAVATION VIEWED BY THE ENGINEER AND BY AN AGENT OF THE BOARD OF HEALTH IN ACCORDANCE WITH TITLE 5 REGULATIONS.
2. SAND SHALL BE PLACED IN THE CLEARING AREA. THE SAND DELIVERED TO THE SITE EACH DAY SHALL BE TESTED AT EITHER THE PROCESSING FACILITY OR AT THE SITE. EACH DAY'S DELIVERY OF SAND SHALL MEET THE REQUIREMENTS OF 310 CMR 15.255(3) WHICH REQUIRES THE FOLLOWING:

SIEVE SIZES	%PASSING:	MIN.	MAX.
#4 (4.75 mm)		100	100
#50 (0.3 mm)		10	100
#100 (0.15 mm)		0	20
#200 (0.075 mm)		0	5
3. THE STONE TRENCHES SHALL THEN BE INSTALLED AND THE LATERALS ABOVE THEM AS WELL AS THE END CAPS AND VENT PIPES AT THE ENDS OF THOSE LINES.
4. FIVE INSPECTION PORTS CONSISTING OF 6 INCH DIAMETER PERFORATED PVC PIPE EXTENDING TO NATIVE MATERIALS BELOW THE SOIL ABSORPTION SYSTEM SHALL BE INSTALLED IN THE LOCATIONS SHOWN. EACH INSPECTION PORT SHALL HAVE A HAND HOLE COVER VISIBLE AT THE GROUND SURFACE.
7. THE VENTS FROM BOTH THE ENDS OF THE TRENCHES CLOSER TO THE MANIFOLD AND FURTHER FROM IT SHALL BE EXTENDED AWAY FROM THE SYSTEM TO END IN DISGUISED STRUCTURES, THE PRESBY BIRD BATH OR APPROVED EQUAL.
8. THE FORCE MAIN SHALL HAVE A MINIMUM OF 4 FEET OF COVER IN ALL CASES.
9. THE CONTRACTOR MAY COMPLETE THE INSTALLATION OF THE SEPTIC TANKS, PUMP CHAMBER AND FORCE MAIN INDEPENDENTLY, IN SEQUENCE, FROM THE INSTALLATION OF THE SOIL ABSORPTION SYSTEM.



- NOTES:
1. THE PUMPS SHALL BE MOUNTED ON THE PULTRUDED SLIDE RAIL SYSTEM.
 2. MERCURY FLOAT SWITCHES SHALL BE USED ON A POWER CIRCUIT SEPARATE FROM THAT OF THE PUMPS AND SET TO ACTIVATE THE ALARM IN THE BUILDING WHEN FLUID IN THE CHAMBER REACHES A DEPTH 6 INCHES HIGHER THAN THE PUMP ON ELEVATION.
 3. VISIBLE AND AUDIBLE ALARMS ARE TO BE PLACED IN THE BUILDING.
 4. ALL WIRING TO BE PLACED OUTSIDE OF THE BUILDING SHALL BE IN CONDUIT AND INSTALLED ACCORDING TO APPLICABLE CODES.
 5. THE ALARM IS TO HAVE AN ALTERNATIVE POWER SUPPLY TO BE ABLE TO SOUND IN THE EVENT OF A GENERAL POWER FAILURE.

DIG SAFE:

EXCEPT FOR VISIBLE STRUCTURES (MANHOLES, GATES, POLES, ETC.) LOCATED BY THOMPSON-LISTON ASSOCIATES, INC., ALL UNDERGROUND UTILITIES SHOWN WERE COMPILED ACCORDING TO AVAILABLE RECORD PLANS FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES AND ARE APPROXIMATE ONLY. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD BEFORE DESIGNING, EXCAVATING, BLASTING OR INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORATION, OR REPAIRING. ALL UTILITY COMPANIES, PUBLIC & PRIVATE, MUST BE CONTACTED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN. EXPEDITED ENGINEERING, LLC. ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. CALL "DIG SAFE" AT 1-800-322-4844.

SATISFYING DEP PRESSURE DISTRIBUTION DESIGN GUIDANCE: SECTION II. DESIGN PROCEDURE

1. LAY OUT A NETWORK – THE DIMENSIONS OF THE SOIL ABSORPTION SYSTEM WERE ESTABLISHED BY APPLYING THE EFFLUENT LOADING RATES FROM 310 CMR15.242. A LAYOUT WITH A CENTRAL MANIFOLD WAS CHOSEN AS THIS FITS SPACE CONSTRUCTIONS AND OUR DESIRE TO LIMIT THE LENGTH OF THE DISTRIBUTION LINES. A SINGLE MANIFOLD WILL BE LOCATED IN THE MIDDLE OF THE SOIL ABSORPTION SYSTEM.
2. SELECT PERFORATION SIZE AND SPACING – DEP ADVOCATES THAT DESIGNS INCLUDE AS MANY PERFORATIONS AS POSSIBLE WITH PERFORATION SIZES IN THE RANGE BETWEEN 1/8 INCH AND 5/8 INCH IN SIZE. WE CHOOSE PERFORATIONS 1/8 INCH DIAMETER IN ORDER TO KEEP THE REQUIRED PUMP PERFORMANCE AS REASONABLE AS POSSIBLE. WE CHOOSE TO LOCATE THE PERFORATIONS AT 5 O'CLOCK AND 7 O'CLOCK AS SEEN IN A CROSS SECTION OF THE DISTRIBUTION LATERALS TO AVOID THE NEED FOR EXTRA SHIELDING. WE BEGIN WITH THE CHOICE OF FAIRLY TYPICAL 2 INCH DIAMETER DISTRIBUTION LATERALS. FROM FIGURE 8A IN APPENDIX B OF THE PRESSURE DISTRIBUTION DESIGN GUIDANCE WE FIND THAT FOR 56 FOOT LONG DISTRIBUTION LATERALS HAVING A 2 INCH DIAMETER AND 1/8 INCH PERFORATIONS THE RECOMMENDED SPACING OF THE PERFORATIONS IS BETWEEN 2 AND 3 FEET APART. WE WILL USE A PERFORATION SEPARATION OF 4 FEET. THIS IS ABOVE THE RECOMMENDATION OF THE CHART BUT STILL BELOW DEP'S RECOMMENDED MAXIMUM OF 5 FEET SEPARATION.
3. CALCULATE THE LATERAL DISCHARGE RATE – A MINIMUM DISTAL HEAD PRESSURE OF 2.5 FEET IS EXPECTED FOR PRESSURE DISTRIBUTION SYSTEMS TO MINIMIZE VARIATION IN THE APPLICATION OF EFFLUENT PUMPED OUT OF THE SOIL ABSORPTION SYSTEM. HOWEVER, THE HEAD APPLIED TO EACH DOSE OF EFFLUENT PUMPED OUT OF THE PUMP CHAMBER SHOULD NOT BE EXCESSIVE TO AVOID UNNECESSARY FRICTION LOSS IN THE SYSTEM AND UNNECESSARY REQUIREMENTS FOR PUMPING POWER. WE WILL CHOOSE TO HAVE THE MINIMUM DISTAL HEAD PRESSURE OF 2.5 FEET. SO, USING TABLE 1 OF APPENDIX C OF THE PRESSURE DISTRIBUTION DESIGN GUIDANCE WE FIND THAT FOR IN LINE PRESSURE OF 2.5 FEET OF HEAD AND 1/8 INCH DIAMETER PERFORATIONS THE DISCHARGE RATE FOR EACH PERFORATION IS 0.29 GALLONS PER MINUTE. EACH 56 FOOT LONG LATERAL SHALL HAVE 13 PERFORATIONS SO THE LATERAL DISCHARGE RATE IS $13 \times 0.29 = 3.77$ GPM.
4. CALCULATE THE MANIFOLD SIZE – USING TABLE 2 OF APPENDIX C OF THE PRESSURE DISTRIBUTION DESIGN GUIDANCE AND WITH A LATERAL DISCHARGE RATE OF 3.77 GPM AND AN INTENDED LATERAL SPACING OF 8 FEET APART (CENTERED OVER 2' WIDE TRENCHES EACH 6' APART) WE HAVE TO EXTRAPOLATE FOR A PROPOSED 12 INCH DIAMETER MANIFOLD APPROXIMATELY 192 FEET LONG BUT IT SEEMS REASONABLE GIVEN THAT A MANIFOLD AS SMALL AS 5 INCH DIAMETER WOULD BE ACCEPTABLE ACCORDING TO TABLE 2. USING THIS EXTRA LARGE DIAMETER MANIFOLD WILL HELP TO EVEN OUT FLOW TO THE DISTRIBUTION LINES.
5. DETERMINE THE DOSE VOLUME – DEP SUGGESTS THAT THE MINIMUM DOSE VOLUME SHOULD BE FIVE TO TEN TIMES THE VOLUME OF THE DISTRIBUTION LATERAL NETWORK. THE PRESSURE DISTRIBUTION DESIGN GUIDANCE ADVISES DOSING AS FREQUENTLY AS POSSIBLE. WE PROPOSE FOUR DOSES PER DAY. WITH A DESIGN LOADING OF 7480 GALLONS PER DAY THIS GIVES A DOSE VOLUME OF 1,870 GALLONS. BUT EACH TIME THAT DOSE IS APPLIED TO THE SOIL ABSORPTION SYSTEM, THE MANIFOLD AND FORCE MAIN WILL ALSO BE FILLED WITH EFFLUENT THAT DRAINS BACK TO THE PUMP CHAMBER.

THE VOLUME OF THE 12" MANIFOLD IS $(\pi(12^2))/4 \times 192$ FEET LENGTH=150.8 CUBIC FEET OR 1,128 GALLONS. THE VOLUME OF THE 6" FORCE MAIN IS $(\pi(0.50^2))/4 \times 398$ FEET LENGTH=33.8 CUBIC FEET OR 253 GALLONS. SO THE TOTAL VOLUME THAT MUST BE PUMPED WITH EACH DOSE IS $1,870 + 253 + 1,128 = 3,251$ GALLONS. THE VOLUME OF THE LATERAL NETWORK IS $42 \times (\pi(0.167^2))/4 \times 56$ FEET LENGTH = 51.5 CUBIC FEET OR 385.2 GALLONS. SO, THE DOSE VOLUME OF 3,251 GALLONS IS 8.42 TIMES THE LATERAL VOLUME AND COMFORTABLY WITHIN THE RANGE OF 5-10 TIMES LATERAL VOLUME SUGGESTED BY DEP.

6. CALCULATE THE MINIMUM PUMP DISCHARGE RATE – THE MINIMUM PUMP DISCHARGE RATE IS DETERMINED BY ADDING THE LATERAL DISCHARGE RATES. SO THE MINIMUM PUMP DISCHARGE RATE FOR THIS SYSTEM IS 42×3.77 GALLONS PER MINUTE PER LATERAL = 158 GALLONS PER MINUTE.

7. CALCULATE THE TOTAL FRICTION LOSSES – DEP RECOMMENDS CALCULATING FRICTION LOSS USING A VARIATION OF THE HAZEN WILLIAMS EQUATION, $FRICTION\ LOSS = Ld(3.55Qm/Chd^{2.63})^{1.85}$ WHERE Ld IS THE LENGTH OF THE FORCE MAIN FROM THE PUMP CHAMBER TO THE DISCHARGE LATERAL NETWORK, IN FEET, Dd IS THE PIPE DIAMETER OF THE FORCE MAIN IN INCHES, Qm IS THE DISCHARGE RATE IN GALLONS PER MINUTE AND Ch IS EQUAL TO 150 FOR PLASTIC PIPE.

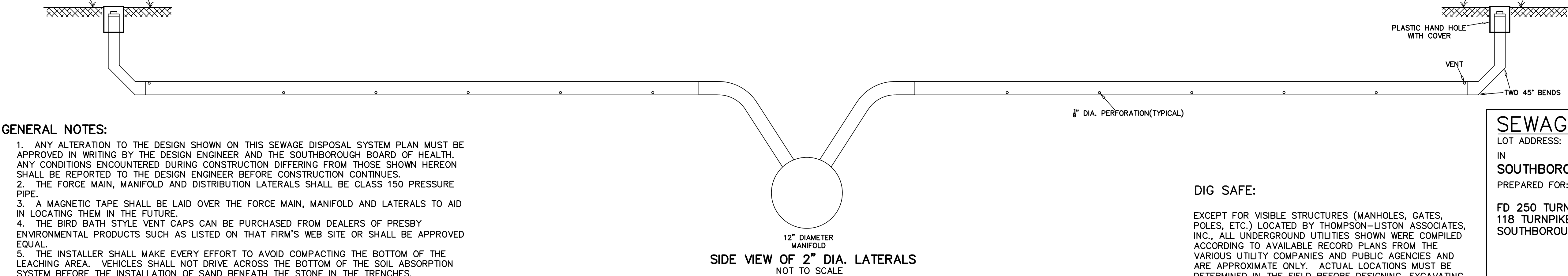
THE LENGTH OF THE FORCE MAIN IS 398 FEET BUT THERE ARE EXPECTED TO BE ONE 90° VERTICAL BEND IN THE LINE AND TWO 90° HORIZONTAL BENDS, TWO 45° HORIZONTAL BENDS AS WELL AS A GATE VALVE THAT THE EFFLUENT WILL PASS THROUGH AND TWO EXPANSIONS. THESE FEATURES ADD EQUIVALENT LENGTH TO THE DISTANCE PUMPED SO THAT THE TOTAL EQUIVALENT LENGTH THAT MUST BE USED FOR Ld IS $398' + 1(13') + 2(13') + 11' + 2.5' + 2(10') = 470.5$ FEET. $Qm=158$ GALLONS PER MINUTE, SO THE FORMULA BECOMES:

$FRICTION\ LOSS = 470.5(3.55(158)/150(4)^{2.63})^{1.85} = 6.0$ FEET IN THE FORCE MAIN AND DEP SUGGESTS ASCRIBING NETWORK LOSSES DUE TO FRICTION OF $1.31X$ DISTAL HEAD PRESSURE OR $1.31X2.5' = 3.28$ FEET, GIVING TOTAL FRICTION LOSS IN THE FORCE MAIN AND NETWORK OF 4.3 FEET.

WITH A STATIC HEAD DIFFERENCE OF 44.58 FEET (LATERAL INVERT=350.70 – PUMP OFF ELEV.=306.12), WE GET A TOTAL DYNAMIC HEAD OF 50.6 FEET.

8. SELECT THE PUMP UNIT – USING THE PARAMETERS OF A PUMP HAVING TO DOSE 158 GPM AGAINST 50.6' TDH, WE SELECT A BARNES MODEL 4SE7544L 7.5 HP (OR APPROVED EQUAL) PUMP WHICH CAN PERFORM AT THOSE RATES AND WILL HAVE A 4 INCH DISCHARGE.

9. SIZING THE PUMP CHAMBER – THE PUMP CHAMBER MUST BE OF A CAPACITY TO HOLD THE DAILY DESIGN FLOW OF THE SYSTEM ABOVE THE HIGH WATER ALARM. THE HIGH WATER ALARM WILL BE AT ELEVATION 309.50 WHILE THE INVERT ELEVATION OF THE DISCHARGE LINE WILL BE AT 316.45, 6.95 FEET HIGHER. WITH INSIDE DIMENSIONS OF 16' X 9', THIS GIVES AN EMERGENCY STORAGE VOLUME OF 1,009 FT³ OR 7,490 GALLONS, JUST OVER THE DAILY DESIGN FLOW OF 7,480 GALLONS, AS REQUIRED BY DEP.



GENERAL NOTES:

1. ANY ALTERATION TO THE DESIGN SHOWN ON THIS SEWAGE DISPOSAL SYSTEM PLAN MUST BE APPROVED IN WRITING BY THE DESIGN ENGINEER AND THE SOUTHBOROUGH BOARD OF HEALTH. ANY CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFERING FROM THOSE SHOWN HEREON SHALL BE REPORTED TO THE DESIGN ENGINEER BEFORE CONSTRUCTION CONTINUES.
2. THE FORCE MAIN, MANIFOLD AND DISTRIBUTION LATERALS SHALL BE CLASS 150 PRESSURE PIPE.
3. A MAGNETIC TAPE SHALL BE LAID OVER THE FORCE MAIN, MANIFOLD AND LATERALS TO AID IN LOCATING THEM IN THE FUTURE.
4. THE BIRD BATH STYLE VENT CAPS CAN BE PURCHASED FROM DEALERS OF PRESBY ENVIRONMENTAL PRODUCTS SUCH AS LISTED ON THAT FIRM'S WEB SITE OR SHALL BE APPROVED EQUAL.
5. THE INSTALLER SHALL MAKE EVERY EFFORT TO AVOID COMPACTING THE BOTTOM OF THE LEACHING AREA. VEHICLES SHALL NOT DRIVE ACROSS THE BOTTOM OF THE SOIL ABSORPTION SYSTEM BEFORE THE INSTALLATION OF SAND BENEATH THE STONE IN THE TRENCHES.
6. WATER SERVICE TO THE PROPOSED BUILDING WILL BE FROM MUNICIPAL SERVICE EXTENDED TO THE BUILDING THROUGH THE PARKING AREA TO THE NORTHWEST CORNER OF THE PROPOSED BUILDING.
7. TO PREVENT POTENTIAL SEWAGE BREAKOUT, AN IMPERMEABLE BARRIER SHALL BE INSTALLED ON THE EAST SIDE OF THE PROPOSED RETAINING WALL WEST OF THE SOIL ABSORPTION SYSTEM. THE ELEVATION OF THE TOP OF THE WALL SHALL BE AT LEAST AS HIGH AS SHOWN ON THIS PLAN. THE BASE OF THE WALL SHALL BE AT LEAST 1 FOOT BELOW EXISTING GROUND. NO MATERIAL OTHER THAN REINFORCED CONCRETE WILL BE ALLOWED. A FIELD STONE DRY WALL BE INSTALLED ON THE BUILDING SIDE OF THE REINFORCED CONCRETE RETAINING WALL FOR APPEARANCE.

SEWAGE DISPOSAL SYSTEM PLAN

LOT ADDRESS: 250 TURNPIKE ROAD, LOT B AREA OF LOT:226,047 S.F.ASSESSORS MAP/PCL: 27/46

IN SOUTHBOROUGH, MASS.
PREPARED FOR:

FD 250 TURNPIKE, LLC.
118 TURNPIKE ROAD, SUITE 300
SOUTHBOROUGH, MA 01772

SCALE: AS INDICATED
DATE: NOVEMBER 20, 2024
REVISIONS:

DESIGNED BY: JLT
DRAWING NAME: 250TURNPIKECURRENT
CLIENT NO.: 504 JOB NO.: 290-504

EXPEDITED ENGINEERING, LLC
CIVIL ENGINEERS & LAND SURVEYORS
118 TURNPIKE ROAD, SUITE 300
SOUTHBOROUGH, MA 01772
(508) 399-9993

